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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/565,990

07/06/2006

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EXAMINER

LEE, CALVIN

ART UNIT

PAPER NUMBER

2892

MAIL DATE

DELIVERY MODE

07/22/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/565,990 | Applicant(s) MANTL et al. | |
| | Examiner Calvin Lee | Art Unit 2892 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>1/24/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

OFFICE ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 2 lack clarity and conciseness because the word “or” is used, respectively, four and six times because the term “passivating element” is vague, and there is not enough support in the description to determine which documents are prejudicial to novelty.

Claim Rejections - 35 USC § 101

3. Claims 1-21 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by an asserted utility.

The application does not contain any example which could put into question the equivalence of C, Si, Sn, S, Se and Te indicated in paragraph 99 of U.S. Patent 3,849,204 to *Fowler* (hereafter referred to as D1, shown below), and could render “chalcogen” inventive in relation to D1. Since, according to paragraph 97 of D1, the charge carrier concentration in the contact layer is supposed to be increased by ion implantation of “impurities,” yet according to paragraph 119 of D1, implantation is carried out in the “n-side electrode” (i.e. titanium silicide), the “impurities” are to be brought out of the titanium silicide to the contact layer, through the boundary surface (by a thermal treatment, see paragraph 119 of D1). However, if no enrichment in the boundary layer is achieved, claim 1 relates to a desired result but fails to indicate essential features.

D1 thus deprives the process as per claims 1-2 at least of inventive step, and there exists no common inventive concept which could link the variants connected in claim 1 by “or” or “and,” or which could link claim 2 to claim 1, thus leading to a lack of unity of invention.

4. Claims 1-21 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by an asserted utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

US 3,849, 204 (document D1) could be prejudicial to the novelty of claims 1-2, with silicon substrate **1** as the first layer and dielectric **2** as the adjacent layer. Hydrogen is implanted in the first layer as a passivating element [page 2, lines 20-25] and a heat treatment is carried out in which the interface is passivated by the hydrogen [Fig. 1C], which is easier if the hydrogen is enriched at the interface. The application does not give any values for hydrogen as a passivating element (despite the requirement of PCT Article 5); therefore, if there is no enrichment in D1, claims 1-2 would claim only a desired result without specifying how it is supposed to be achieved.

U.S. Patent 2001/0038103 to *Nitta et al* (hereafter referred to as document D2), showing a process for establishing a contact between a silicide **34'** ["titanium silicide" in ¶ 96 & 119] and a layer **16** adjacent to the silicide [Fig. 5B], passivation elements ["impurities" in ¶ 99] being introduced into the silicide by ion implantation [¶ 119] and enriched by a thermal treatment at least in one boundary surface of the silicide with the adjacent layer ["heat treatment" in ¶ 119], could be prejudicial to the novelty of claims 1-2, with contact layer **16** as the adjacent layer (a semiconductor layer, as in claim 4) and electrode layer **34'** as the first layer (a metal, as in claim 3). A chalcogen may be selected as passivation element (¶ 119 describes the implantation of silicon, but according to ¶ 99, C, Sn, S, Se and Te have been used as "impurities," besides Si, with equally good results; S, Se and Te are chalcogens). An element such as sulphur, selenium or tellurium (chalcogens, as in claim 11) is implanted [¶ 99] and then removed from the electrode layer by heat treatment [¶ 108], which undoubtedly increases the concentration at the interface. Claims 1-2 would relate to a desired result without specifying how it is supposed to be achieved. However, the application does support chalcogen enrichment at the interface with a silicide (claim 2 in conjunction with claims 10 and 11). Since it cannot be determined whether these documents are relevant or whether there is a lack of unity of invention with claim 2, it is not possible to carry out a meaningful search.

Contact Information

5. Any inquiry concerning this communication from the Examiner should be directed to *Calvin Lee* at (571) 272-1896 on Mondays thru Thursdays 7AM-5PM (EST). If attempts to reach the examiner by telephone are unsuccessful, Art Unit 2892's Supervisory Patent Examiner *Thao Xuan Le* can be reached at (571) 272-1708. The fax phone number for the organization is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAG or Public PAIR. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the PAG system, contact the Electronic Business Center (EBC) at 1-866-217-9197.

Dated: July 14, 2008

/Calvin Lee/
Primary Examiner, Art Unit 2892